

# SYSTEM FOR ALERTING A VEHICLE DRIVER

## PRIOR APPLICATION

This application is a continuation-in-part from application S.N. 10/139,789, filed May 7, 2002.

## BACKGROUND OF THE INVENTION

The present invention relates to a system for alerting a driver of a motor vehicle. More particularly, it refers to a system for detecting a driver's failure to move the steering wheel in a normal manner such as when the driver is drowsy and provides a warning to alert the driver.

It is well known from U.S. Patents 3,106,981 and 3,794,969 that the normal vehicle driver moves the steering wheel at about one quarter of an inch or two degrees every few seconds. The failure to move the wheel within seven seconds is an indication that the driver is drowsy or has fallen asleep. This condition frequently results in dangerous accidents seriously injuring or killing the driver and possibly others. While the aforementioned patents provide a means to alert the driver, there are practical problems in implementing these prior art systems. A practical after market system for alerting a driver when the driver is not operating the motor vehicle in a normal manner is needed.

## SUMMARY OF THE INVENTION

The present invention provides a driver alert system that can be easily mounted to a vehicle. A graduated optic tape is

mounted on a steering component and is read by an optic sensor. If the steering wheel in a moving vehicle is not moved for five to ten seconds as set in a first timer, the system alerts the driver with a buzzer activated for at least a second by a second timer. The system is operated by a D.C. circuit connected to the brake light so that the system will not operate when the brake light is on.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention is best understood by those having ordinary skill in the art by reference to the following detailed description when considered in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of a vehicle driver station showing the location of the alerting system components.

FIG. 2 is a schematic of the driver alerting system electrical elements.

#### DETAILED DESCRIPTION OF THE INVENTION

Throughout the following detailed description, the same reference numerals refer to the same elements in all figures.

Referring to FIGS. 1-2, a strip of reflective tape 10 with graduated lines 12 is affixed to the hub 14 of a steering wheel 16 by glue. An optical sensor motion detector 18 is mounted on the steering column 20 by glue. An oscillator 22 modulates the emission from the optic sensor to a frequency between 5KH<sub>z</sub> and 10KH<sub>z</sub>. The sensor 18 output passes through band-pass filter 24 which passes only the emitter's modulated frequency. This

eliminates the effects covered by ambient light changes,  
sunlight or passing under street lights at night.

The pulses emanating from filter 24 are used to reset  
first timer 26. The timer 26 is manually adjustable between  
5 five to ten seconds by control 28. The timer 26 outputs a  
signal when the optical sensor 18 does not sense movement of  
the steering wheel 16 for the prescribed period of time set by  
control 28. The timer 26 output continues until steering wheel  
16 is moved as determined by sensor 18. Movement of steering  
10 wheel 16 resets timer 26. The second timer 30 provides a  
minimum output of one second regardless of the output duration  
of first timer 26. This assures that audio alert buzzer or  
beeper 32 mounted inside the vehicle will sound a minimum of  
one second. A gate circuit 34 controls the audio buzzer 32 and  
15 allows it to sound only when the brake is not applied. The  
gate 34 is controlled by sensing voltage across the brake light  
switch 36. Voltage across the brake light switch 36 closes the  
switch and prevents current from activating beeper 32.

When a driver fails to move the steering wheel 16 for five  
20 to ten seconds as set in timer 26, by the timer adjustment  
control 28, an audio buzzer 32 will sound. The buzzer 32 will  
not sound when stopped at a traffic light because the circuit  
inhibits the buzzer when it senses the brake light 36 through  
rectifier 40. The circuit is run by the vehicle power supply  
25 or an alternate DC power supply 38.

The alerting means can be a buzzer 32 or a vibrator 42

located in the driver's seat 44. In addition, the circuit could be connected to the vehicle horn 46 to cause it to sound instead of buzzer 32,

5 This system for alerting drivers can be easily installed as an after market item. The optical sensor 18 and reflective tape 10 are merely glued to vehicle components and the electrical connection to the brake light switch 36 is usually found under the vehicle dash board.

10 A substantially equivalent functional system can be produced by substituting substantially equivalent elements for the above described elements to produce substantially the same results in substantially the same way.